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PYRITE CRYSTALS FROM BROADWAY AND 207TH STREET, NEW YORK CITY

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The material for this study was obtained thru the courtesy of Mr. James G. Manchester, who collected a number of specimens of dolomitic limestone from the above locality which yielded on solution highly modified pyrite crystals of somewhat unique development. The crystals, which show a considerable variation in size, are in every instance distorted by a flattening parallel to one cube direction which in several cases results in the suppressing of the modifying planes adjacent to these two cube faces; this is brought out in the frontispiece, in which figure 1 represents a photograph of one of the specimens, and figure 2 a drawing of one of the crystals measured. Another characteristic which distinguishes these crystals is the presence of prominences on planes of the pyritohedron (210) and the octahedron. One rare trapezohedron (766) and several rare diploids were observed, one of the latter constituting a new form for pyrite. All five diploids appear in the upper right hand forward octant of the crystal figured, the new one being next above *s*. The distribution of the forms on the ten crystals measured is given below:

TABLE 1. DISTRIBUTION OF FORMS ON PYRITE FROM NEW YORK CITY

Letter	Symbol	1	2	3	4	5	6	7	8	9	10
a..........	100	×	×	×	×	×	×	×	×	×	×
o..........	111	×	×	×	×	×	×	×	×	×	×
e..........	210	×	×	×	×	×	×	×	×	×	×
n..........	322					×			×		
q..........	211	×	×		×	×	×		×	×	×
	766	×	×		×	×	×			×	×
s..........	321	×	×	×	×	×	×	×	×	×	
𝔅..........	654	×		×	×		×	×			
x..........	543	×	×				×	×		×	
*..........	10.7.4		×	×		×	×	×	×	×	
	753				×						×

The new diploid, (10.7.4), occurred on seven of the ten crystals, and was identified by its angular position in the zone [210: 111]. The reflections were for the most part of good quality and the faces, tho narrow, were bright and well defined.

The measurements which served to identify the modifying forms are as follows:

TABLE 2. ANGLES OF PYRITE FROM NEW YORK CITY

Letter	Angle	Number of measurements	Measured	Calculated	Limits
$a : q$.....	100 : 211	23	35° 17′	35° 16′	34° 55′–35 42′
: n....	: 322	3	43 21	43 19	43 15 –43 31
:	: 766	16	49 25	49 24	48 50 –49 57
$o : \mathfrak{B}_1$....	111 : 654	7	9 22	9 16½	9 8 – 9 32
: x....	: 543	7	11 38½	11 32	11 14 –11 57
:	: 753	5	18 17½	18 5½	18 4 –18 37
: *.....	: 10.7.4	21	19 1½	19 17	18 35 –19 36
: s.....	: 321	32	22 21	22 12½	21 46 –22 57

* New form.

CRYSTALLOGRAPHY OF SOME CANADIAN MINERALS: 8. AXINITE

EUGENE POITEVIN

Geological Survey of Canada[1]

The crystals here described were collected during the summer of 1908[2] by Charles Camsell of the Canada Geological Survey, from the western slope of the Nickel Plate Mountain, Osoyoos Mining Division, British Columbia, where the mineral occurs in hair-brown crystals and crystalline masses associated with crystalline mispickel, opaline quartz, and calcite at the contact of a gabbro porphyry and sedimentary beds.

An analysis made by R. A. A. Johnston of the Geological Survey[3] from carefully selected crystal fragments gave the following results, which with the exception of the water content (which is too low) agree with the formula proposed by W. T. Schaller,[4]

$$8SiO_2.2Al_2O_3.1B_2O_3.2\ (Fe,\ Mn,\ Mg)\ O.4CaO.1H_2O.$$

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[1] Published by permission of the Director of the Geological Survey of Canada. Continued from page 25.

[2] *Summary Rept. Geol. Survey,* **1910**, 259; *Geol. Survey Memoir* No. **2**, **148**; ECONOMIC GEOLOGY, Ries, Ed. 4, 686, 1916.

[3] *Summary Rept. Geol. Survey,* **1910**, 259.

[4] Mineralogical Notes, Series I. *U. S. Geol. Survey, Bull.* **490**, 39.

TABLE 4. ANALYSIS AND RATIOS OF AXINITE, BRITISH COLUMBIA

		Ratios			
SiO_2	42.18	SiO_2		.6995	8.000
B_2O_3	5.22	B_2O_3		.0884	1.011
Al_2O_3	18.12	Al_2O_3	.1773	.1834	2.097
Fe_2O_3	0.98	Fe_2O_3	.0061		
FeO	7.20	FeO	.1002	.1951	2.190
MnO	3.89	MnO	.0584		
ZnO	0.09	ZnO	.0011		
MgO	1.43	MgO	.0354		
CaO	19.91	CaO		.3549	4.058
H_2O	0.35	H_2O		.1093	0.022
Sum	99.37				
Sp. Gr. 3.296.					

It was observed that the finest crystals were implanted upon the opaline quartz. The largest of these so far observed do not exceed 1 cm. in length, while the remainder were of smaller dimensions, some being almost of microscopic size. Owing to the firmness with which they were implanted upon the matrix it was found impossible to detach more than fragments of individuals for purposes of measurement.

Altho a large number of the crystals were examined, measurements were carried out on only nine of them; of the thirty-nine forms which were observed, nine are new. Three others are still uncertain. All symbols are given in Miller's orientation, as modified by Professor V. Goldschmidt.

The prisms $u(1\bar{1}0)$ and $c(010)$ are striated vertically. The domes, also, are usually striated parallel to their zonal intersections. Of forms hitherto rare on axinite, three were observed:

γ (120) was first described by Sjögren[1] and later by Schaller;[2] on crystals from Nickel Plate Mountain it occurs as a very narrow face.

N $(2\bar{9}0)$ of Franck[3] was observed as a face of vicinal character.

ω (203) was observed as a very small face, which gave poor reflections; this form was described by Gonnard,[4] and tabulated with uncertain forms of axinite in Goldschmidt's Atlas der Krystallformen.

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[1] *Bull. Geol. Inst. Upsala,* **1**, 1, 1892.

[2] *Work cited,* 43, 1911.

[3] *Bull. Acad. Belgique,* **25**, 17, 1893.

[4] *Bull. soc. franc. min.,* **16**, 95, 1893; Goldschmidt, Atlas d. Krystallformen, Text I, p. 129.

Table 5. Angle Table for Axinite from British Columbia

Letter	Symbol	Calculated		Measured Average		No. of Read-ings
		ϕ	ρ	ϕ	ρ	
m	001	$\bar{9}0$° 34′	7° 58′	$\bar{9}0$° 22′	8° 21′	4
c	010	00 00	90 00	00 00	90 00	10
γ	120	36 14	“	36 14	“	1
w	110	60 16	“	60 23	“	8
M	100	102 30	“	102 34	“	8
u	$1\bar{1}0$	135 24	“	135 23	“	10
H	$2\bar{3}0$	144 40	“	143 56	“	1
l	$1\bar{2}0$	151 23	“	151 57	“	1
N	$2\bar{9}0$	165 18	“	166 00	“	2
e	011	$\bar{7}$ 58	45 16	$\bar{7}$ 55	45 17	4
z	$0\bar{1}2$	$\bar{1}64$ 24	27 32	$\overline{16}4$ 01	27 25	10
r	$0\bar{1}1$	$\bar{1}72$ 02	45 21	$\bar{1}71$ 50	45 15	11
g	103	108 38	16 30	108 30	16 38	6
f	102	106 03	27 04	106 53	26 50	3
ω	203	105 00	38 47	105 31	38 04	1
a	101	104 04	49 10	104 25	49 16	6
b	$\bar{1}01$	$\overline{78}$ 46	55 02	$\bar{7}8$ 54	55 24	3
μ	$\bar{2}01$	$\overline{78}$ 10	69 50	$\bar{7}8$ 18	70 08	1
o	112	53 49	31 19	53 57	31 12	7
δ	$\bar{1}\bar{1}2$	$\overline{11}5$ 08	40 26	$\overline{11}5$ 00	40 34	3
y	111	57 19	53 08	57 36	53 06	9
x	$1\bar{1}1$	138 48	59 36	138 54	59 43	6
n	$\bar{1}\bar{1}1$	$\overline{11}7$ 16	57 38	$\overline{11}7$ 07	57 41	3
σ	121	33 06	64 03	33 55	64 21	1
W	$2\bar{3}2$	147 48	64 36	148 28	63 43	1
s	$1\bar{2}1$	153 49	68 32	153 42	68 30	5
q	211	79 33	67 35	80 05	67 41	2
*σ_0	130	24 55	90 00	25 15	90 00	4
*ψ_0	201	103 15	67 48	102 49	67 55	2
*Π	205	107 16	20 55	107 48	20 43	3
*Σ	104	112 07	10 44	112 27	10 26	2
*Δ	021	4 00	63 30	3 17	63 30	1
*ϕ_0	$0\bar{3}4$	$\bar{1}69$ 27	37 26	$\bar{1}69$ 09	37 39	1
*p_0	735	82 44	58 38	83 33	58 48	1
*λ_0	312	87 25	60 20	87 13	60 10	1
*x_0	$\bar{3}\bar{2}2$	$\bar{1}05$ 59	64 42	$\bar{1}05$ 57	64 42	1
*Ω	$\bar{1}80$	$\bar{1}0$ 03	90 00	$\bar{9}$ 30	90 00	1
*A_0	$1\bar{6}0$	169 00	“	169 24	“	1
*B_0	$3\bar{7}0$	154 14	“	154 49	“	2

* New forms.

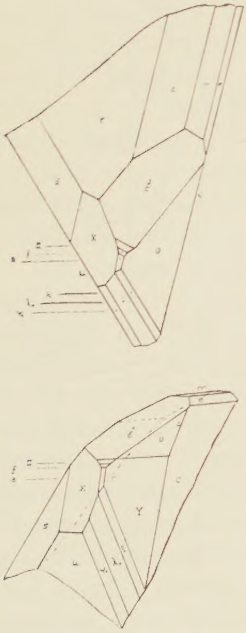
The new macro domes: ψ_0 (201), Π (205), and Σ (104), altho of small size, possess sufficient brilliancy to give good reflections. (See Figs. 6, 7 and 8.)

The brachy prism: σ (130) was observed four times as a long narrow face. (Fig. 8.)

The brachydomes: Δ (021) and φ_0 ($0\bar{3}4$) are among the new forms. They were observed in but single instances. (Fig. 8.)

The new macro pyramids: p_0 (735); λ_0 (312); x_0 ($\bar{3}\bar{2}2$) were observed as faces of fair size and of brilliant luster. (Figs. 6 and 8.)

The brachy prisms: Ω ($\bar{1}80$); A_0 ($1\bar{6}0$); B_0 ($3\bar{7}0$) are placed here as uncertain vicinal forms.



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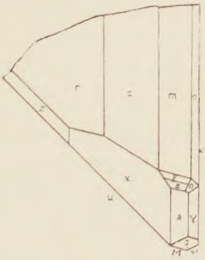

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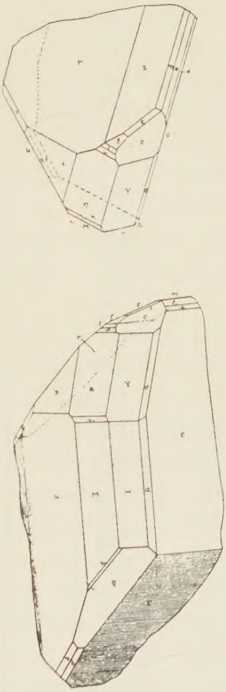

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AXINITE, NICKEL PLATE MOUNTAIN

FIG. 6. Orthographic and clinographic projections of crystal showing the new forms II (205), ψ_0(201), λ_0(312), and p_0(735).

FIG. 7. Orthographic projection of a crystal showing the new form II (205).

FIG. 8. Orthographic and clinographic projections of crystal showing the new forms Σ(104), ψ_0(201), Δ(021), σ_0(130) and x_0 ($\bar{3}\bar{2}2$).

The following table is arranged to show the combinations of forms on nine measured crystals:

TABLE 6. COMBINATIONS OF FORMS ON AXINITE CRYSTALS

		1	2	3	4	5	6	7	8	9
m......	001	+	+	+	+	+	+		+	+
c......	010	+	+	+	+	+	+	+	+	+
α......	120	+								
w......	110	+	+	+	+	+	+		+	
M......	100	+	+	+	+	+	+		+	
u......	$1\bar{1}0$	+	+	+		+	+	+	+	+
H......	$2\bar{3}0$	+								
l......	$1\bar{2}0$					+	+		+	+
N......	$2\bar{9}0$	+		+						
e......	011	+		+		+		+		
z......	$0\bar{1}2$	+	+	+		+	+	+	+	+
r......	$0\bar{1}1$	+	+	+		+	+		+	+
g......	103	+	+	+	+	+		+		
f......	102	+			+			+		
ω......	203	+								
a......	101	+	+	+	+	+		+	+	
b......	$\bar{1}01$	+	+				+			
μ......	$\bar{2}01$						+			
o......	112	+	+	+	+	+		+	+	+
δ......	$\bar{1}\bar{1}2$	+	+				+			
y......	111	+	+	+	+	+		+	+	+
x......	$1\bar{1}1$	+	+	+	+	+		+	+	+
n......	$\bar{1}\bar{1}1$	+	+				+			
σ......	121	+				+				
W......	$2\bar{3}2$				+					
s......	$1\bar{2}1$	+		+		+		+		+
q......	211		+		+					
$^*\sigma_0$....	130	+	+							
$^*\psi_0$....	201	+						+		
$^*\Pi$....	205		+	+				+		
$^*\Sigma$.....	104	+	+							
$^*\Delta$.....	021	+								
$^*\varphi_0$....	$0\bar{3}4$		+							
$^*p_0$....	735							+		
$^*\lambda_0$....	312		+					+		
$^*x_0$....	$\bar{3}\bar{2}2$	+								
$^*\Omega$.....	$\bar{1}80$	+								
$^*A_0$....	$1\bar{6}0$			+	+					
$^*B_0$....	$3\bar{7}0$	+		+						

New forms marked *.

FAMOUS MINERAL LOCALITIES: THE PELHAM ASBESTUS MINE, MASSACHUSETTS.

EARL V. SHANNON
Springfield, Mass.

The old asbestus mine in Pelham, Mass., is worthy an examination no less for its historic interest than for its unique geologic and mineralogic features. Being within reasonable walking distance of Amherst College, this locality was one of the favorite haunts of Prof. Shepard, and during its exploitation it was visited by many prominent mineralogists of the last century.

It is rather difficult to accurately direct others to the location of the mine. The collector seeking the locality will no doubt be supplied with Emerson's geologic map of Massachusetts[1] and a copy of the Ware topographic sheet. Upon the former there are shown, in the south of Pelham township, three red spots which indicate peridotite outcrops. The Ware sheet will serve as a road map to take one to the location of these areas, and then exact directions must be sought at farmhouses. The Pelham car line, out of Amherst, terminates just south of Mount Orient and gives one a good start in the right direction. The middle peridotite area is the asbestus mine.

The geology of the mine has been described by Emerson, the main features being that a reaction rim, containing unusual minerals, has formed between an intrusion or inclusion of very basic rock—peridotite—and the enclosing, highly acid Pelham gneiss, the whole reproducing, on a grand scale, the microscopic rim commonly seen surrounding olivine phenocrysts in certain igneous rocks. Only the main pit was examined by the writer, the smaller pits being largely concealed by brush and dead leaves. The mass of rock exposed in the bottom of this quarry is dark gray in color and fine-granular in texture. This granular material, which is olivine colored dark by magnetite or chromite dust, contains scattered square phenocrysts of bronzy enstatite up to 3 cm. in length, the whole forming a typical fresh saxonite and hence being of considerable interest to a petrographer. The gray olivine was analyzed by Shepard who, believing it to be a new species, named it "pelhamine." This makes it somewhat of a mineralogic curio and as such it should find place even in a strictly mineralogical collection. In the outer portion the saxonite is changed completely to fibrous anthophyllite, many masses tons in weight being almost pure anthophyllite of pearl gray color and silky luster, which makes handsome specimens. In places these confused masses of fibrous anthophyllite are traversed by gray aphanitic veins, a few centimeters in thickness, of a mineral which may be massive anthophyllite but which has not yet been investigated. In places the masses of anthophyllite have straight fibers 3 or 4 dm. long, such masses constituting the asbestus mined. This material was also analyzed by Shepard, and given the name "asbestite." Between the anthophyllite rock and the feldspar zone is a biotite layer. In the wall now exposed, the zones are not everywhere in the same orderly sequence, the biotite layer, especially, being branching and compound. Below the plagioclase feldspar there is, at the base, a thin layer of a brown clay, probably the "dillnite" of Shepard, above which is a layer of friable granular biotite 5 to 15 cm. thick, composed of more or less distinct tabular crystals, somewhat hydrated and altered. Above this biotite is a 4 or 5 cm. layer of a saponaceous silvery blue green material in fine scales, which become opaque pale olive green when dry. These scales exfoliate upon ignition, and leave silvery plates of silica when dissolved in acids. Two samples, both of which were slightly contaminated with biotite and actinolite, gave, upon analysis, the results under 1 and 2 in table 1. That this is the vermiculite named pelhamite by J. P. Cooke[1] is shown by comparison with his average analysis, no. 3; this is classed by Dana as a variety of jefferisite.

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[1] Accompanying U. S. Geol. Survey *Bull.* 597.

Table 1. Analyses of Pelhamite

	1	2	3
SiO_2	40.08	38.88	41.27
Al_2O_3	21.65	19.27	15.19
Fe_2O_3	3.59	3.99	4.14
CaO	0.58	——	——
MgO	20.12	22.66	28.25
$H_2O - 105°$	3.79	3.56	——
$H_2O + 105°$	7.83	9.54	11.32
	97.64	97.90	100.17

Above the vermiculite layer is an interrupted layer from 3 to 20 cm. in thickness of friable grass-green actinolite, succeeded upward by the main band of schistose golden-brown biotite which reaches 6 dm. in thickness in places. This biotite, where seen in place, contained round nodules of gray corundum, up to 500 grams in weight, streaked and spotted with deep blue; grass green nodules of fibrous actinolite, and disseminated perfect terminated crystals of black tourmaline up to 3 cm. in length. Masses of biotite loose on the quarry floor contain bladed black hornblende crystals and granular masses of black hornblende. Above the biotite is the great mass of reaction-rim plagioclase, granular in texture and grading in composition from anorthite next the biotite, to acid oligoclase nearest the gneiss. Within this layer, which is several dm. in thickness, are large masses of imperfectly crystallized black tourmaline. The plagioclase is separated from the gneiss by another thin band of bronzy biotite.

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[1] *Proc. Am. Acad. Arts Sci.*, **1875**, 454.

During an afternoon's visit there were obtained many good specimens of olivine (saxonite), anthophyllite, granular and crystallized hornblende, fibrous actinolite, biotite, corundum, vermiculite and plagioclase. The additional minerals villarsite, rutile, apatite, zoisite and allanite, mentioned from here by Emerson and others, were not found by the writer but may easily have been overlooked in the short time spent at the mine. The mineral collector in New England will find that a day spent at this locality is well invested.

NOTES AND NEWS

A soft blue-white diamond weighing 388 ¼ carats has been found at the Jagersfontein mine, Orange River Colony. This promises to become one of the diamond fields' historic gems. It is said to be the largest stone unearthed since the Cullinan diamond was discovered in 1905. In the rough the latter weighed about 3,000 carats; the famous Koh-i-noor weighs about 100 carats. (*Eng. and Min. J.*, **107**, (5), 248, 1919.)

Sir Lazarus Fletcher, whose contributions to mineralogy are well known, retired from the directorship of the Natural History Museum, (London), under the age limit, on March 31.

The increase in the number of pages per issue of this magazine, forecasted in our January editorial, goes into effect this month. This has been made possible by generous financial assistance extended to us by friends, whose names we list here that subscribers may know to whom they are indebted for the additional reading matter thus made available to them:

Mr. Clarence S. Bement, of Philadelphia; Mr. Albert C. Burrage, of Boston; Dr. George F. Kunz, of New York; Mr. James G. Manchester, New York; Col. Washington A. Roebling, of Trenton; Mr. Gilman S. Stanton, of New York; and Col. William B. Thompson, New York.

One additional page is to be devoted to our "Abstracts of mineralogic literature," enabling us to bring this department up to date more rapidly than has heretofore been possible, and to increase somewhat the average length of abstracts, thereby enhancing their usefulness. We will also be able to publish at least one full-page plate in every number. We are planning a number, to appear early next year, devoted to the application of the Goldschmidt two-circle goniometer to the study of crystals, and an appreciation of the contributions to science of Professor Victor Goldschmidt. We are glad to announce that the construction of these goniometers in this country is under consideration by a well-known firm of instrument-makers.

PROCEEDINGS OF SOCIETIES

THE NEWARK MINERALOGICAL SOCIETY

The twenty-ninth regular meeting of the Newark Mineralogical Society was held on February 2, at the Newark Technical School, with Dr. Colton presiding and an attendance of 52 per cent. of our membership; there were also present three visitors.

After the usual routine of business, during which one application was favorably acted upon and two others received, one of our members, Mr. Schoonmaker, presented a paper on quartz inclusions, supplemented with a large array of specimens.

The presenting of papers by members has proved to be a great incentive towards bringing out the members. Last month Mr. A. C. Bates read a paper on quartz inclusions, and the month previous Mr. Holzman read a paper on the minerals of Chimney Rock, N. J., and Wm. H. Broadwell a paper on Paterson as a mineral locality. WM. H. BROADWELL, *Secretary.*

THE PHILADELPHIA MINERALOGICAL SOCIETY

Wagner Free Institute of Science, February 13, 1919

A stated meeting of The Philadelphia Mineralogical Society was held on the above date with the President, Dr. Leffmann, in the chair, and later, Mr. Trudell. Fifteen members and visitors were present.

Mr. J. C. Boyle and Mr. William Lee were elected active members.

Mr. R. J. Hagey addressed the society on "The rudiments of optical mineralogy." The movement of light in anisotropic media was described, and illustrated with sections projected on a screen, showing the various phenomena of interference and dispersion.

A vote of thanks was extended to Mr. Hagey for his interesting communication and exhibition. SAMUEL G. GORDON, *Secretary.*

THE MINERALOGICAL SOCIETY (LONDON)

January 14, 1919

Mr. W. Barlow, past-president, in the chair. A. Hutchinson: Stereoscopic lantern-slides of crystal pictures. The twin pictures are projected by means of a double lantern thru screens of complementary colors—red and green—and are viewed thru similarly tinted screens, one for each eye. If the adjustment is correct, a black and white picture stands out in relief. The method admits of the properties of crystals and crystal structure being demonstrated simultaneously to a large number of students. J. S. Spencer: Mineralogical characters of "turite" (= turgite) and some iron-ores of Nova Scotia. The mineral collection of the late Dr. H. S. Poole, which was presented to the British Museum in 1917, contains among the iron-ores specimens of magnetite, hematite, "turite," goethite, limonite, chalybite (siderite), mesitite, and ankerite from many localities in Nova Scotia. The dehydration curves and optical properties of "turite" ($2Fe_2O_3. H_2O$), goethite ($Fe_2O_3.H_2O$), and limonite ($2Fe_2O_3.3H_2O$) are regarded as indicating that these, at least, among the large group of ferric hydroxide minerals, are distinct species with crystalline structure; some others are colloidal. "Turite" (= turgite, an incorrect German transliteration from the Russian) is a hard, lustrous, black mineral, with a radial-fibrous and concentric-shelly structure, and gives a dark cherry red streak; the fibers are optically birefringent and strongly pleochroic. Sharp brilliant crystals with the form of goethite, but consisting of anhydrous ferric oxide, or pseudomorphs of hematite after goethite, were also described. *Nature*, **102**, (2569), 418–419, 1919.

NEW MINERALS

ORVILLITE

T. H. Lee. Two new zircon minerals—orvillite and oliveiraite. *Am. J. Sci.*, [4], **47**, (2), 126–132, 1919. (Translated by J. C. Branner from *Revista da Sociedade Brasileira de Sciencias*, No. 1, pp. 31–38, Rio de Janeiro, 1917.)

NAME: after the late Dr. Orville A. Derby.

An analysis of zircon crystals in cavities in "caldasite,"—a rock composed of baddeleyite, from Caldas, Minas Geraes,—indicated the presence of a relatively soluble zirconium silicate corresponding to $8ZrO_2.6SiO_2.5H_2O$. Some of the material was separated under the microscope by Derby and analyzed: ZrO_2 68.04, SiO_2 25.45, volatile matter and combinedH_2O 6.35, sum, 99.72 per cent. No description of the physical properties is given.

S. G. G.

OLIVEIRAITE

T. H. Lee, *place cited*. NAME: after Dr. Francisco de Paula Oliveira.

COLOR: yellowish green. Apparently amorphous, but under the microscope shows in places multiple twinning and a radial fibrous structure.

COMPOSITION: a hydrated titanate of zirconium $3ZrO_2.2TiO_2.2H_2O$. An analysis of material selected under the microscope gave: ZrO_2 63.36, TiO_2 29.92, combined H_2O 6.48, sum 99.76 percent.

OCCURRENCE: with euxenite, as a secondary product.

LOCALITY: Espirito Santo, Brazil. S. G. G.

ABSTRACTS OF MINERALOGIC LITERATURE

TWO NEW ZIRCON MINERALS—ORVILLITE AND OLIVEIRAITE. T. H. LEE. *Am. J. Sci.*, [4], **47**, (2), 126–132, 1919. (Translated by J. C. Branner.)

The two minerals described have been noted above, under NEW MINERALS. The paper includes 2 analyses of euxenite from Espirito Santo, and Pomba, Minas Geraes, Brazil. An analysis of the yellow crust due to the decomposition of the euxenite gave: Cb_2O_5 and Ta_2O_5 52.51, TiO_2 25.00, rare earths R_2O_3 7.40, UO_3 4.93, combined H_2O 11.14, sum 100.98 per cent. S. G. G.

REVIEW OF PROGRESS OF MINERALOGY FROM 1864 TC 1918. G. T. Prior. *Geol. Mag* , [6], **6**, (1), 10–16, 1919.

GADOLINITE FROM THE RADAUTHAL, HARZ. J. Fromme. *Centr. Min. Geol.*, **1917**, 305–307; thru *J. Chem. Soc.*, **112**, ii, 497, 1917.

A description with analysis of gadolinite crystals occurring with quartz, prehnite, and allanite in cavities in graphic granite. E. T. W.

ANALYSES OF VENETIAN MINERALS. E. Billows. *Z. Kryst. Min.*, **55**, 389–390, 1916; thru *J. Chem. Soc.*, **112**, ii, 492–493, 1917.

Data are given for allophanite, analcite, heulandite, and the new zeolite arduinite. E. T. W.

PISANITE FROM LADING, CARINTHIA. H. Leitmeier. *Centr. Min. Geol.*, **1917**, 321–331; thru *J. Chem. Soc.* **112**, ii, 537–538, 1917.

Two new analyses are given, and the composition of this mineral discussed. An isomorphous series, with a gap at both ends, is represented. E. T. W.

STRONTIANITE DEPOSITS NEAR BARSTOW, CALIF. A. Knopf. *U. S. Geol. Survey Bull.* **660–I**, 257–270, 1918.

A geological description, with some chemical data, of interesting occurrences of strontianite. This material occurs in dense gray form resembling limestone, and in fibrous masses of resinous luster, imitated by brown calcite from other localities in the region. E. T. W.

THE IDENTITY OF SPANGITE WITH PHILLIPSITE. F. Zambonini. *Atti acad. sci. Torino*, **53**, 47–54, 1917–18; thru *Chem. Abstr.*, **12**, (11), 1161, 1918.

An original specimen of the so-called spangite has been examined microchemically, and found to be free from magnesium; its properties are those of phillipsite. E. T. W.

OPTICAL FLUORITE IN SOUTHERN ILLINOIS. Joseph E. Pogue. *Ill. Geol. Survey Bull.* **38**, 8-page extract, 1918.

The properties needed to render fluorite of value for lens manufacture are discussed, and the discovery of deposits of sufficient extent to supply domestic demands is announced. E. T. W.

THE HALOGEN SALTS OF SILVER AT WONDER, NEVADA. J. A. Burgess. *Econ. Geol.*, **12**, 589–594, 1917.

The occurrence of embolite, iodobromite, and iodyrite is described, and the source of the halogen elements discussed. E. T. W.

ANHYDRITE IN BLOCKS CARRIED BY THE LAVA OF STROMBOLI. G. Ponte. *Atti accad. Lincei*, **26**, II, 348–350, 1917; thru *Chem. Abstr.* **12**, (13), 1375, 1918.

A description with analysis of rough anhydrite crystals in cavities in dolerite blocks. E. T. W.

THE FORMATION OF DIAMOND. C. A. PARSONS. *Engineering*, **105**, 485–487, 1918.

From new experiments it is concluded that in the artificial production of diamond in molten iron the presence of gases, especially of carbon monoxide, is favorable. The possibility is discussed of making diamonds of commercially valuable sizes. E. T. W.

THE RELATION OF SPHALERITE TO OTHER SULFIDES IN ORES. L. P. TEAS. *Bull. Am. Inst. Mining Eng.*, **1917**, 1917–1931.

Mineralographic studies of about 200 specimens were made, five different paragenetic types being represented. Certain correlations could be made between associations and origin, as for instance, chalcopyrite is often found, arranged along crystallographic directions, in sphalerite formed by ascending juvenile waters, but not in that formed by meteoric waters. E. T. W.

BLACK SULFUR. BERNHARD NEUMANN. *Z. angew. Chem.*, **30**, I, 165–168, 1917; thru *J. Chem. Soc.*, **112**, ii, 464, 1917.

The black sulfur from Mexico which has been regarded as an allotropic form of the element (and therefore as an independent mineral species) has been examined, and is found to consist of ordinary sulfur with inclusions of carbon and metallic sulfides. E. T. W.

SYNTHETIC EXPERIMENTS IN THE PYROXENE GROUP. VERA SCHUMOFF-DELEANO. *Centr. Min. Geol.*, **1917**, 290–304; thru *J. Chem. Soc.*, **112**, ii, 496–497, 1917.

In order to obtain evidence as to the nature of aluminous augite, diopside was fused with Al_2O_3 and with Fe_2O_3. About 15% of each oxide was found to be taken up, altho when both were added at the same time new minerals were formed. A fusion with the composition $MgAl_2SiO_6$, often assumed as present in the natural mineral, was found to be unstable; but $MgSiO_3$ and $CaSiO_3$ will take up 15% of Al_2O_3 in solid solution. E. T. W.

AN AMERICAN OCCURRENCE OF PERICLASE AND ITS BEARING ON THE ORIGIN AND HISTORY OF CALCITE-BRUCITE ROCKS. AUSTIN F. ROGERS. *Am. J. Sci.*, [4], **46**, (4), 581–586, 1918.

Periclase occurs as colorless 1 mm. cores in brucite in a crystalline limestone at the City Quarry, Riverside, Cal. The brucite is dark gray to brown and composed of concentric layers of microscopic fibers, representing an alteration product of the periclase. Associated with it are pyrrhotite, olive-green spinel ($n > 1.740$), magnetite, antigorite, and chondrodite.

Other occurrences of calcite-brucite rocks in America are noted from the Mountain Lake Mine, near Salt Lake City, Utah; the Phillipsburg Quadrangle, Mont.; and Crestmore, Cal.; and it is believed that these rocks are also due to the alteration of periclase to brucite caused by ascending hydrothermal waters. The following history is given for the Crestmore occurrence: sedimentary limestone, dolomitic limestone, dedolomitized limestone, with periclase, calcite-brucite rock, calcite-hydromagnesite rock, calcite-deweylite rock; minerals in deposits in general are formed in such stages.

S. G. G.

MEANS OF SOLVING CRYSTAL PROBLEMS. J. M. BLAKE. *Am. J. Sci.*, [4], **46**, (5), 651–662, 1918.

LUMINESCENCE OF ZIRCONS. F. P. VENABLE. *J. Elisha Mitchell Sci. Soc.*, **34**, (3), 73–75, 1918.

A review of the literature on the composition, cause of color, luminescence, etc., of zircon. S. G. G.

ORIGIN OF SERPENTINE, A HISTORICAL AND COMPARATIVE STUDY. W. N. BENSON. *Am. J. Sci.*, [4], **46**, (6), 693–731, 1918.

After reviewing critically the extensive literature on the origin of serpentine, the writer concludes that his several inquiries support the general view in regard to the large ultrabasic masses that the chrysotile or antigorite serpentine of which they are composed is an alteration product of an originally intrusive peridotite, often more or less pyroxenic, and that in some cases at least the hydration was brought about by the agency of waters emanating from the same magma that produced the peridotite, tho not generally until a considerable amount of further differentiation had taken place. The change was, however, completed by the end of the one orogenic period of vulcanicity. There is yet to be explained satisfactorily the absences of hydration in certain cases, but it is not so clear that serpentine can be formed by the action of deep circulating epigene waters on peridotites that have escaped hydrothermal alteration. Peripheral serpentinization is somewhat analogous to greisenization of granite. Iddingsite and bowlingite are products of true weathering. S. G. G.

The recently issued Annual Report of the Smithsonian Institution for 1918 (June 1917–June 1918) lists the following especially noteworthy accessions to the collections: A series of minerals of the rarer metals, obtained chiefly thru the efforts of Mr. Frank L. Hess, including a block of scheelite ore, weighing over 1,000 kg., believed to be the largest mass ever mined; many fine specimens of molybdenite, ferberite, carnotite, uvanite, etc.; and a mass of sandstone impregnated with the blue water-soluble molybdenum mineral ilsemannite. In the division of mineralogy and petrology gifts of exceptional value from Mr. C. S. Bement included particularly fine exhibition specimens of hetaerolite; crystals of rhodonite, zincite, leucophœnicite, manganosite and willemite; a large cut gem of the last named; and a specimen of willemite with friedelite and a white zeolite(?); all from Franklin Furnace, N. J.; calamine, pyrite and milky quartz, from Colorado; free crystals of scheelite and scheelite attached to chalcopyrite, from Mexico; an exceptionally fine large twinned crystal of quartz and an unusual crystal of danburite, from Japan; the rare mineral achtaragdite and a variety of vesuvianite, viluite, from Siberia. The American consul at Changsha, China, Mr. Nelson T. Johnson, donated a specimen of twinned cinnabar crystals from China, showing 7 groups of crystals more than 1.5 cm. in diameter, as far as known the finest of its kind in the United States. Other additions included crystals of tetrahedrite imbedded in quartz, galena with crystals of anglesite, gem stones of variscite, opalized shells from South Australia, beryl, milky quartz crystals, crystals of selenite, some large pyrites, aragonite crystals, and type specimens of minerals described by Dr. Henry S. Washington, Professor A. S. Eakle, and Dr. W. F. Hillebrand.

PLATE 5.

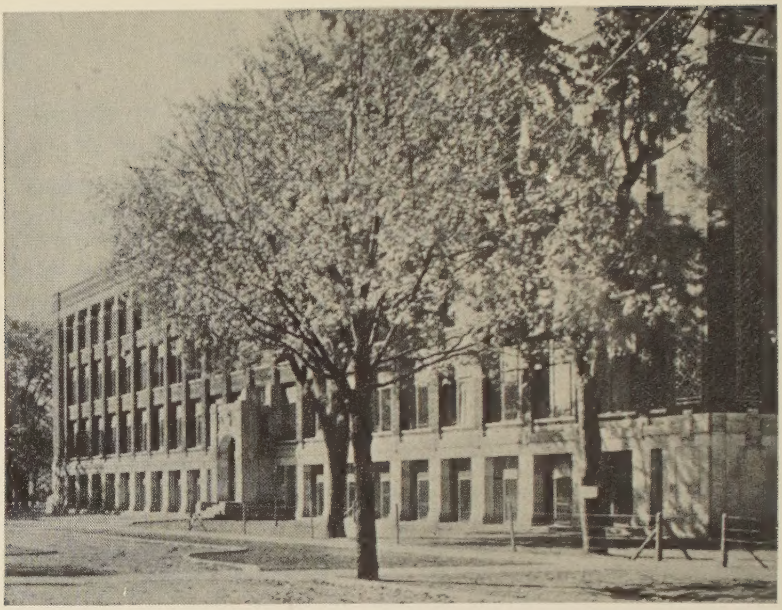

FIG. 1. The Natural Science Building.

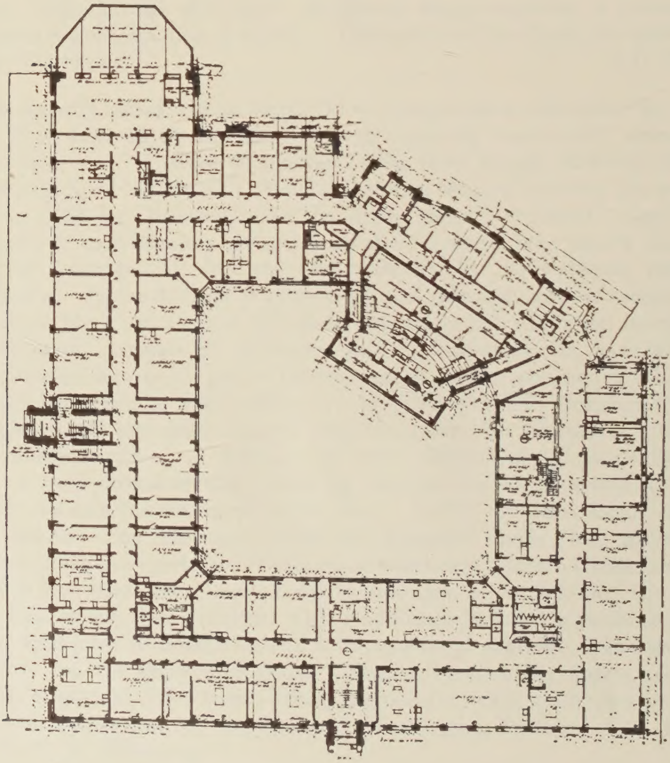

FIG. 2. Plan of ground floor of Natural Science Building.